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# THE FOUNDATION COMPANY LIMITED

ENGINEERS & CONTRACTORS

MONTREAL 1914 VANCOUVER



THE FOUNDATION COMPANY LIMITED

ENGINEERS & CONTRACTORS

MONTREAL 1914 VANCOUVER



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*Foundations*

FOUNDATIONS,  
SUBSTRUCTURES,  
AND  
SUBAQUEOUS  
WORKS

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JAN 10 1916

Montreal

The Foundation Company, Limited

Vancouver

## OUR SCOPE

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Dams

Pump Pits

Bridge Piers

Light Houses

Bulkheads

Retaining Walls

Heavy Building Foundations

Tunnels

Sea Walls

Mine Shafts

Wharves

Intake Cribs

Water Power Construction

Shoring and Underpinning

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**W**E solicit your inquiries and are prepared to promptly make borings and report conditions, prepare designs and submit estimates of cost.

In construction, we adopt methods to meet existing conditions which insures economy and the completion of the work in the shortest possible time.

Our organization and equipment is essentially adapted to promptly commence operation on works of any magnitude.



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## PRELIMINARY INVESTIGATION

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**I**N designing works of this nature, too much emphasis cannot be laid on the necessity of securing accurate data before the final design is adopted. This data is best secured by means of Diamond Drill Borings, which furnish accurate information as to the character, depth and bearing value of all material overlying the rock, and also determines the depth and character of the rock itself. Such data is absolutely necessary for the intelligent study of problems of this kind. Money spent for a thorough investigation of the material in which structures are to be built is money well invested, and is generally the means of effecting a large saving in the ultimate cost of the work, as it insures a correct design and enables the contractors to adopt at the start the most economical methods of construction.

The Foundation Company, Limited, have a number of Diamond Drill Boring outfits available in various parts of Canada, and are prepared on short notice to supply drilling outfits and crews for the purpose of investigating subaqueous or underground conditions.



**T**HE foundations for the Government Customs Warehouse, Montreal, consisted of 132 concrete piers carried to rock at a depth of 75 feet below curb level, the overlying water-bearing material being soft muck, quicksand, sand, gravel and boulders.

These piers were constructed by the pneumatic caisson method. The entire foundations were installed in about ten months.





Customs House, Montreal  
May 1913 — March 1914



**U**NDER extremely difficult conditions the foundations for the Government Customs House at Ottawa, were carried to rock. The deepest excavation was 118 feet below curb level.

The piers were carried through quicksand and various water bearing stratas of sand, gravel and boulders by the drop shaft and open pole board methods. The old course of an underground river was found beneath this lot, which made the installation of safe foundations one of the most difficult jobs of its kind ever constructed by us in Canada.





Customs House, Ottawa  
July 1913 — April 1914



**T**HE Dominion Express Building, St. James Street, Montreal, is supported by concrete piers carried through quicksand, gravel and clay to rock. The Foundation Company, Limited, constructed these piers by the pneumatic method.





Dominion Express Building, Montreal  
November 1910 — March 1911



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**T**HE founding of large and expensive buildings on floating foundations where the supporting value of the soil is at all questionable, is gradually being abandoned by architects and engineers as being too risky for the amount of money involved in the structures.

For a small increase in cost, positive concrete foundations to rock can be installed, which provide the same factor of safety for the substructure as modern practice demands in the design of superstructures.



**T**HE foundations for the C.P.R. Windsor Station, Montreal, were installed by The Foundation Company, Limited, by the use of the Chicago Well method. About 300 caissons were sunk through sand, gravel and clay to rock, which was found about 45 feet below curb level.





Canadian Pacific Railway Windsor Station, Montreal  
November 1909—May 1910



**T**HE Atlantic Sugar Refiners, Limited, plant at St. John, N.B., comprising some seven or eight buildings, was constructed on foundations carried through soil of uncertain supporting value to elevations where positive bearing was secured, and any possibility of disturbance, due to tidal action, was eliminated.

This work was carried out by The Foundation Company, Limited.





Foundations for Atlantic Sugar Refineries Plant, at St. John, N.B.  
January 1913 — November 1913



**T**HE C.P.R. Bridge over Mud Lake, near Maberley, Ont., on the new C.L.O. & W. low grade freight line was constructed by The Foundation Company, Limited, during a period of six months.

Three piers of this bridge were constructed by the pneumatic method. One of these piers was completely finished twenty-eight days after it was designed. Another of these is the deepest pneumatic bridge pier in Canada. It was carried 103 feet below the surface of the water and required the use of about forty-eight pounds of air per square inch in the caisson.





February 1913



August 1913

Mud Lake Bridge



**I**N constructing the new Canadian Pacific Bridge over the St. Lawrence River at Lachine, Que., it was necessary to extend the old piers to accommodate the increased width of the new structure. Additional piers were constructed and bonded into the masonry of each of the old piers.

This was accomplished by the use of the open cofferdam method and the pneumatic method, the piers being carried to rock. On account of the great depth of water and the swift current at this point the construction was of a very difficult nature.





Canadian Pacific St. Lawrence River Bridge  
July 1910 — October 1911



**T**HE Canadian Pacific Railway Bridge at Harrison Mills, B.C., consisting of 11 piers and 2 abutments, was constructed by The Foundation Company, Limited, in about nine months.

Seven of these piers and the abutments were carried well into the river bed and founded on piles, and the remaining four piers were carried to rock by the use of pneumatic caissons.

An interesting feature of this work was the use of an arched base for the four pneumatic piers. The slope of the rock along the centre line of these piers was very steep and the use of this design considerably reduced the cost of the work and eliminated a large amount of rock excavation below water.





Canadian Pacific Railway Bridge, over the Harrison River, B.C.  
June 1913 — April 1914



**T**HE substructure of the Highway Bridge over the Miramichi River at Newcastle, N.B., for the Provincial Government, was built by sinking open dredging caissons to a maximum depth of sixty feet below water level, and excavating to a safe depth below river bottom where piles were driven through 60 feet of water. Owing to tidal variation and current conditions, the construction of these piers was extremely difficult.





Constructing Piers for Government Highway Bridge, over Mirimachi River, at Newcastle, N.B.  
May 1913 — June 1914



**T**HE reconstruction of the Q.M. & S. Railway Bridge over the St. Francois River was carried out by The Foundation Company, Limited, after this bridge had been destroyed by the ice and spring floods. Piers were carried well below the river bottom by open cofferdams and were founded on piles, the work being completed in five months.





Quebec, Montreal & Southern Railway Bridge, over the St. François River, Pierreville, Que.  
June 1913 — November 1913



**T**HE substructure of the Algoma Eastern Railway Bridge at Little Current, Ont., was built by The Foundation Company, Limited, during the winter of 1912 and 1913. This substructure consisting of four piers and two abutments was founded on solid rock by the open caisson method.



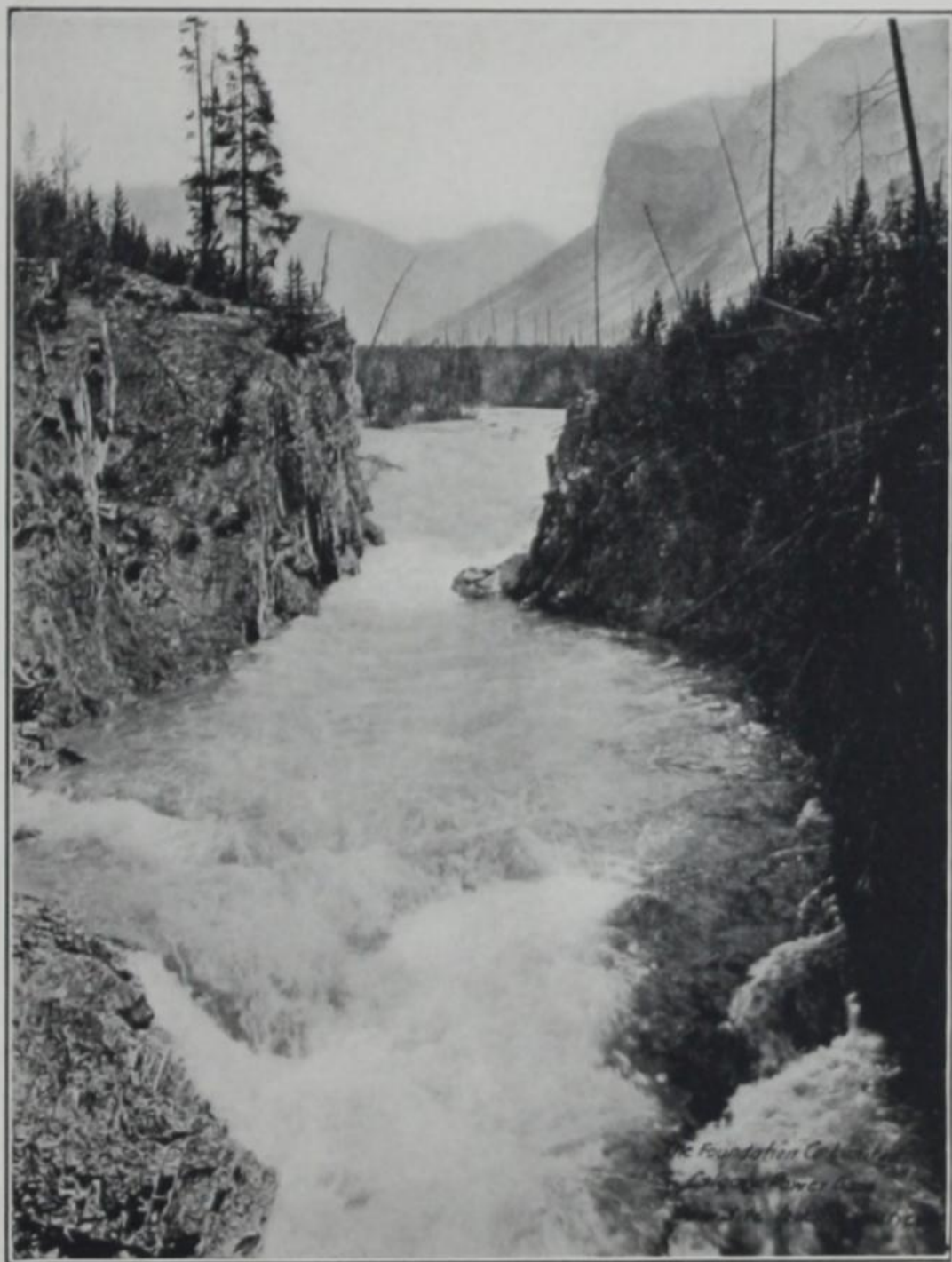


Algoma Eastern Railway Bridge, at Little Current, Ontario  
November 1912 — May 1913



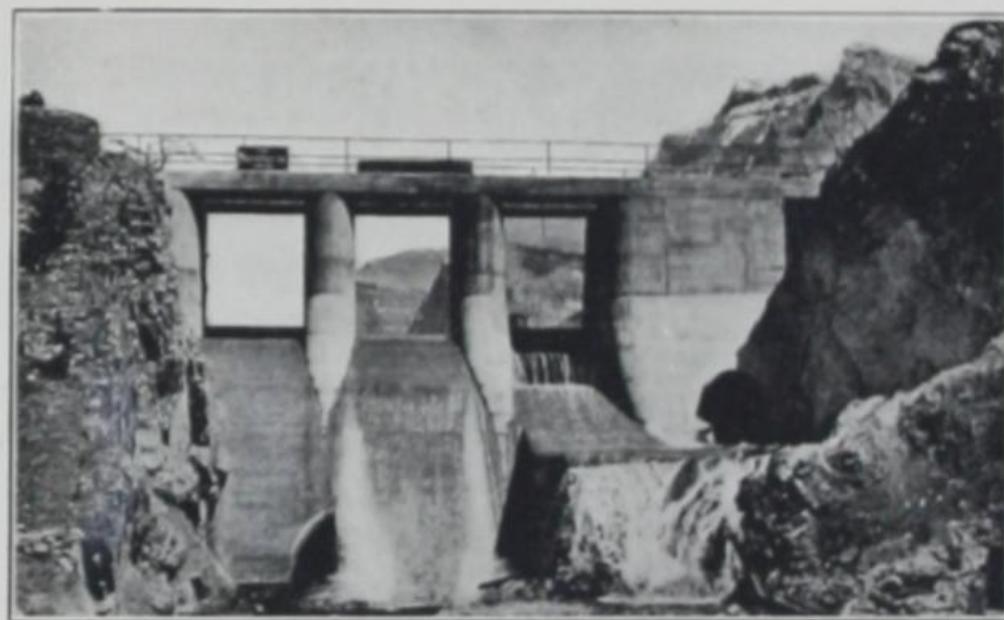
**T**HE dam shown on the opposite page was constructed in four months by The Foundation Company, Limited, for the Calgary Power Company, near Banff, Alta. This work was difficult on account of the narrow width and the extreme depth of the gorge. The dam was constructed for the purpose of raising the level of Lake Minnewanka for storage purposes.





March 1912

Dam for Calgary Power Co., near Bankhead, Alta.

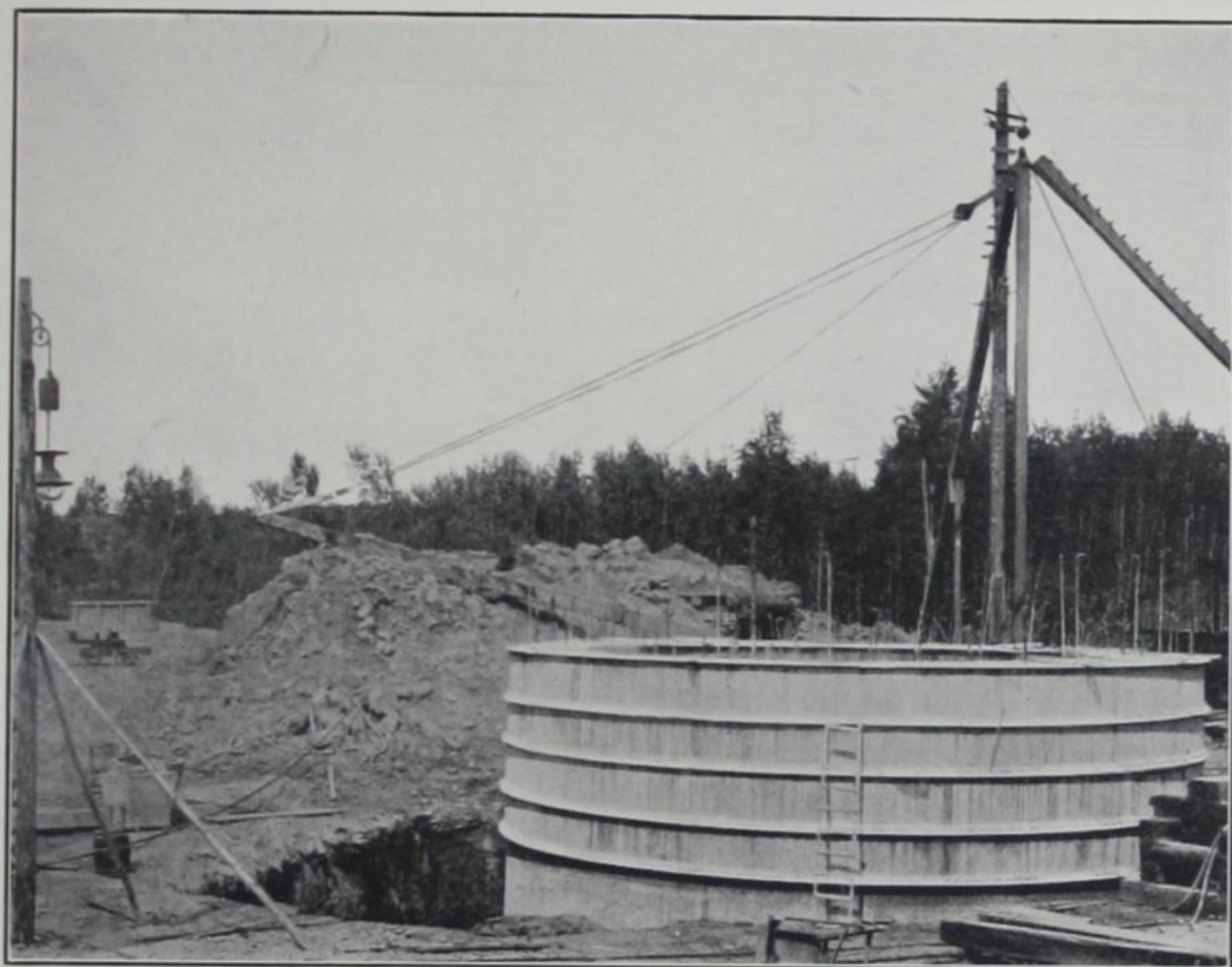


May 1912

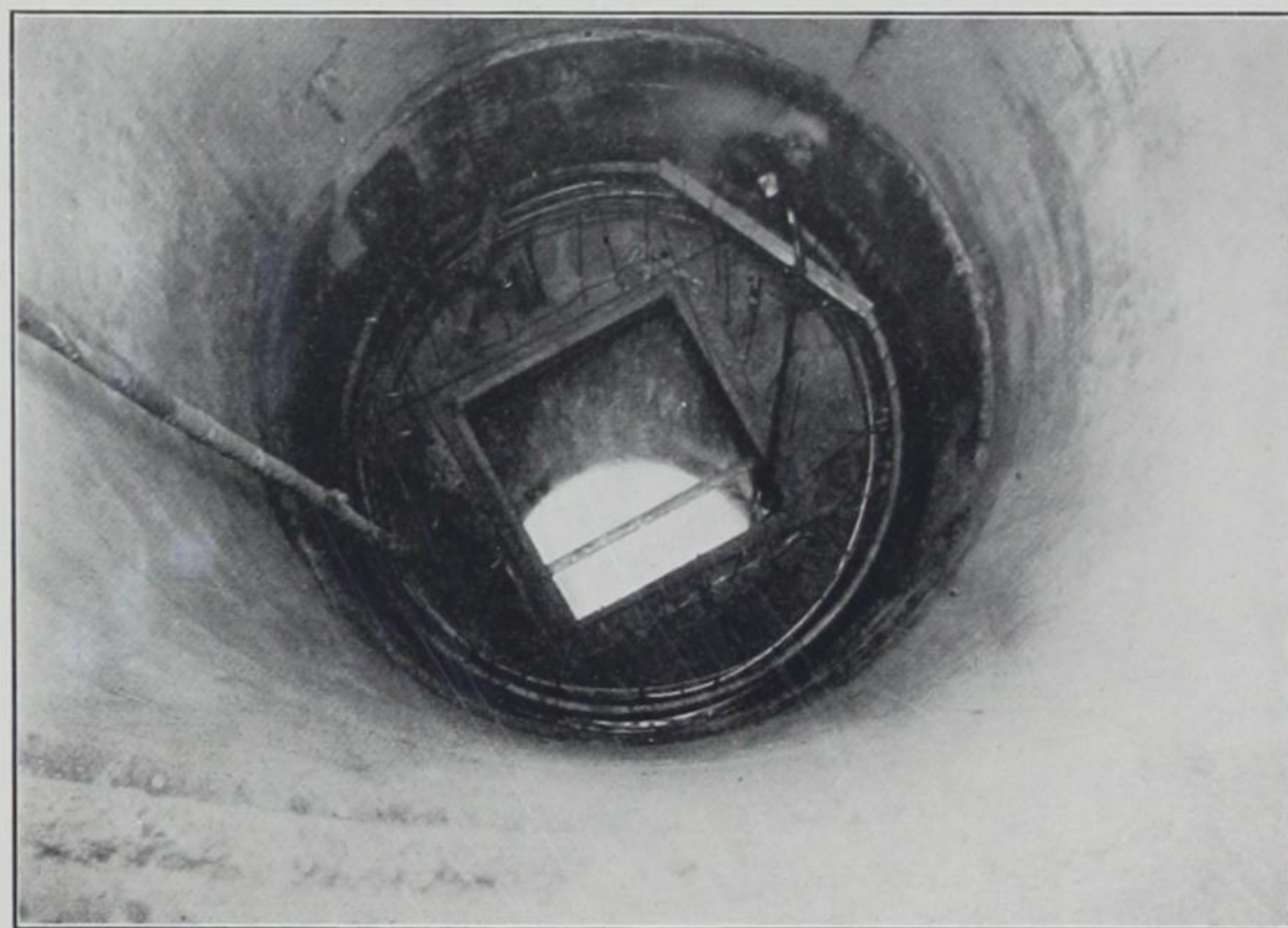


**T**HE St. Albert Collieries Mine Shaft, near St. Albert, Alta., presented a most difficult piece of mine construction work. This shaft had to be carried through treacherous water bearing soil to a depth of 208 feet, where a watertight seal was made into the ledge rock. This work was successfully completed in about eight months by the Foundation Company, Limited.





Mine Shaft for St. Albert Collieries, Limited, near St. Albert, Alta.  
May 1912 — May 1913

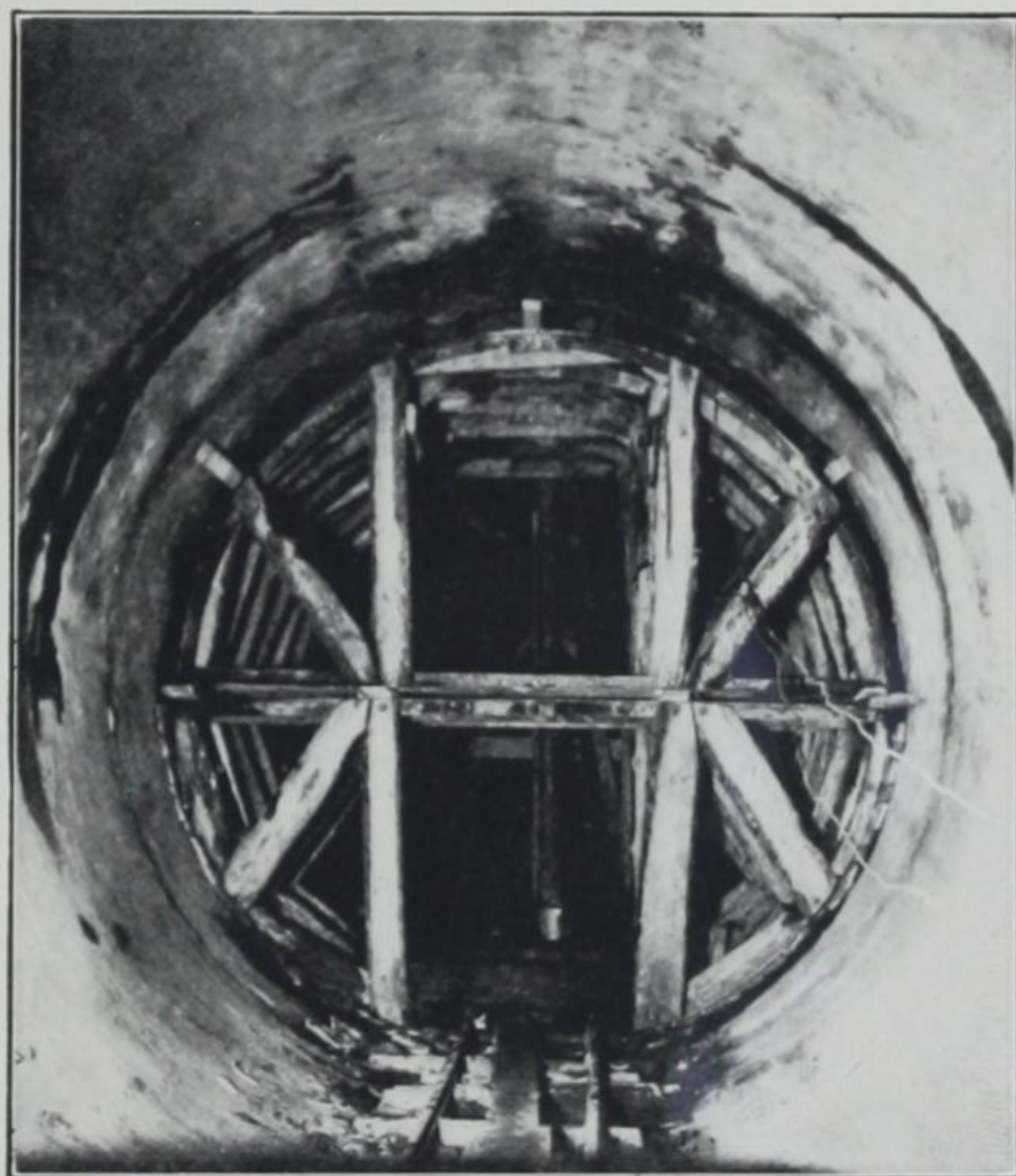


Looking Down Shaft



**T**HE tunnel shown on the opposite page was built by The Foundation Company, Limited, for the Aluminum Co. of America, at Shawinigan Falls, Que. This work consisted of a 13 foot diameter tunnel, 1100 feet long, driven through soft ground by the timbering method.





Tunnel for Aluminum Company of America



**T**HE C.P.R. Grain Elevator at North Transcona, Manitoba, which was originally built on floating foundations, recently failed due to overloading of the soil, causing the bins to settle and list to an angle of about 27 degrees. After this failure The Foundation Company, Limited, were employed to bring the bin structure back into position and to underpin it with concrete piers carried to bed rock, which was found about 50 feet below ground level, also to shore the warehouse structure and to install concrete piers under this building to rock.





Straightening and Underpinning Canadian Pacific Grain Elevators, at North Transcona, Man., after the Failure of the Foundations in Nov. 1913



**I**N excavating building lots where the adjoining structures are carried on spread footings, there is often a great danger of unbalancing soil pressures, causing these structures to settle.

In installing foundations for the Dominion Express Building, Montreal, it was necessary to provide a system of shoring for the Royal Bank of Canada Building which would insure safe support for this building while the adjoining lot was being excavated. Extreme caution was necessary to prevent any settlement of the Royal Bank of Canada Building, as the interior walls are lined with marble which would easily show cracks with a very slight settlement of the building.

The photograph on the opposite page shows the method employed by The Foundation Company, Limited, to provide this support. The load on the adjoining wall was carried on a steel girder and transferred through the pusher shores to timber grillages below.



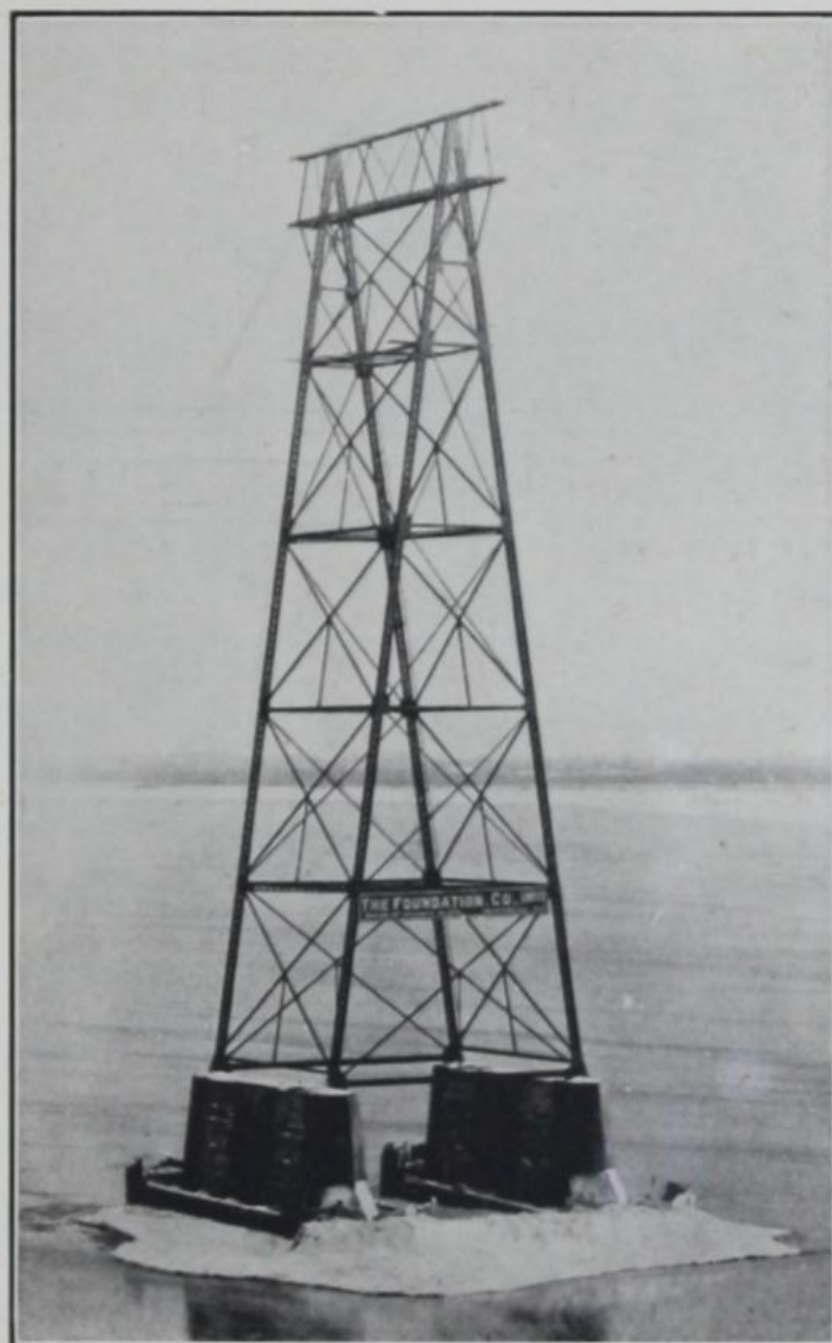


Shoring Royal Bank of Canada Building, St. James Street, Montreal, while  
Installing Foundations for Dominion Express Building



**I**N carrying transmission lines over large bodies of water, it is often difficult to secure suitable piers for towers. The opposite photograph shows a pier constructed in the middle of the St. Lawrence River, near Lachine, Que., for the Canadian Light & Power Company, which The Foundation Company, Limited, built in a nine mile current, carrying the pier to a depth of about 30 feet below the surface of the water.





Transmission Piers for C. L. & P. Co. Line,  
over St. Lawrence River, Montreal



## WATERPROOFING

**T**HE advantages of having dry basements, cellars, etc., are obvious. The Foundation Company, Limited, have spent a great deal of time and money in trying out the merits of various waterproofing processes, and have recently secured the rights in Canada of what is known as the "Cow Bay" waterproofing, which we believe is the only method of waterproofing basements, floors, walls, etc. which is absolutely effective. We do not sell this waterproofing, but we prepare the surfaces and do the work ourselves, and we guarantee the job for a period of five years.

We invite the inquiries of anyone interested in a waterproofing process which is absolutely certain, and which has stood the test of long use under the most adverse conditions.



## SHORING AND UNDERPINNING

**W**HERE buildings or other structures have settled, or otherwise failed, due to insufficient foundations, changes in the soil conditions, or to any other causes, it is often necessary to immediately provide additional temporary support and to install footings that will properly take care of the loads involved. We have done a great deal of this kind of work, and are always prepared to undertake a proposition of this kind on very short notice.



Montreal

The Foundation Company, Limited

Vancouver

SOME OF THE MORE IMPORTANT WORK WHICH  
THE FOUNDATION COMPANY, LIMITED, HAVE CONSTRUCTED  
IN RECENT YEARS IN CANADA

JOB	LOCATION	OWNER	ENGINEER or ARCHITECT	
Atlantic Sugar Refineries Plant	St. John, N.B.	Atlantic Sugar Ref.	Henry Holgate	Montreal
Government Customs House	Montreal	Dominion Government	D. Ewart	Ottawa
Government Customs House	Ottawa	Dominion Government	D. Ewart	Ottawa
Dominion Express Co. Building	Montreal	Dominion Express Co.	Ed. & W. S. Maxwell	Montreal
Windsor Station	Montreal	Canadian Pacific Ry.	W. S. Painter	Montreal
North Transcona Grain Elevator	North Transcona	Canadian Pacific Ry.	J. G. Sullivan	Winnipeg
Bear River Bridge	Bear River, N.S.	Dominion Atlantic Ry.	G. G. Hare	Digby, N.S.
Newcastle Highway Bridge	Newcastle, N.B.	N.B. Provincial Govt.	A. R. Wetmore	Fredericton
St. François River Bridge	St. François du Lac, Que.	Q.M. & S.	E. L. Gibson	Sorel
Mud Lake Bridge	Maberley, Ont.	Canadian Pacific Ry.	C. W. P. Ramsay	Montreal
Magnetawan River Bridge	Byng Inlet, Ont.	Canadian Pacific Ry.	S. B. McConnell	North Bay, Ont.
Little Current Bridge	Little Current, Ont.	Algoma Eastern Ry.	R. S. McCormick	Sault Ste. Marie, Ont.
C.P.Ry. Soo Bridge (Underpinning)	Sault Ste. Marie, Ont.	Lake Superior Power Corp.	J. S. H. Wurtele	Sault Ste. Marie, Ont.
C.P.Ry. Kildonan Bridge	Winnipeg, Man.	Canadian Pacific Ry.	Frank Lee	Winnipeg
Red River Bridge	Winnipeg, Man.	Canadian Pacific Ry.	Frank Lee	Winnipeg
Brandon Bridge	Brandon, Man.	Canadian Pacific Ry.	Frank Lee	Winnipeg
Harrison River Bridge	Harrison Mills, B.C.	Canadian Pacific Ry.	H. Rindall	Vancouver
Pitt River Bridge	Pitt River, B.C.	Canadian Pacific Ry.	H. Rindall	Vancouver
St. Lawrence River Bridge	Lachine, Que.	Canadian Pacific Ry.	P. B. Motley	Montreal
Washademoak Bridge	Cody, N.B.	Canadian Pacific Ry.	P. E. Rosenörn	Fredericton
Pivot Pier Fredericton Bridge	Fredericton, N.B.	N.B. Provincial Govt.	A. R. Wetmore	Fredericton
Calgary Power Dam	Banff, Alta.	Calgary Power Co.	H. E. Johnston	Calgary
St. Albert Mine Shaft	St. Albert, Alta.	St. Albert Collieries, Ltd.	Chas. Fergie	Montreal
Shawinigan Tunnel	Shawinigan Falls, Que.	Aluminum Co. of America	E. S. Fickes	Montreal
Algoma Eastern Terminals	Little Current, Ont.	Algoma Eastern Ry.	R. S. McCormick	Sault Ste. Marie, Ont.
Transmission Piers	St. Lawrence River, Lachine, Que.	Can. L. & P. Co.	J. D. Evans	Montreal
Soo Trestle	Sault Ste. Marie, Ont.	Lake Superior Power Corp.	J. S. H. Wurtele	Sault Ste. Marie, Ont.
Elgin Sewage Pump Station	Montreal	City of Montreal	Major Stuart Howard	Montreal
McGill Union Building	Montreal	McGill Union	P. E. Nobbs	Montreal







